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The advantages of deep and thorough prep



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SPECIAL PAPERS
OF THE
ALABAMA WEATHER SERVICE.

NO. II.

*THE ADVANTAGES OF DEEP AND THOROUGH
PREPARATION OF THE SOIL.*

BY
CAPTAIN W. H. GARDNER OF MOBILE, ALA.

*Published in the printing office of the Alabama Polytechnic Institute by
the special order of the Board of Trustees.*

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NOTE.

This interesting paper is the second in the series of special articles that will be issued from time to time through the Central Office of the Alabama Weather Service.

The material for these publications will be furnished by persons who are known to be careful observers, and whose names will stand before the public as a guarantee of the accuracy of their work.

P. H. MELL Jr.,
Director.

July 9th. 1886.

THE ADVANTAGES OF DEEP AND THOROUGH PREPARATION OF THE SOIL.

By

Captain W. H. Gardner.

With a constant tendency to reduced productiveness on the older lands of Alabama and an evident want of profit on the basis of present yield, there appears to be a necessity, either to increase the yield by improved methods, by adaptation to other and more profitable crops or to abandon a large proportion of the present arable area.

The very unfavorable results of the last few years are generally attributed to droughts, excessive rains, insect ravages &c. but by reference to the history of the years of largest yield, we are warranted in the conclusion, that deep and thorough preparation of the soil, and subsequent cultivation, contributed more largely to the abundant yield than other causes. It is a singular fact that the largest yield of cotton per acre ever produced in Alabama concurred with the smallest annual rainfall recorded in the history of the state. It is another and significant fact that in each instance a very light average summer precipitation was preceded by a cool late spring, during which time the soil was deeply and thoroughly broken by frequent ploughings, and maintained in a loose, mellow condition throughout the blooming and maturing seasons

The most notable seasons presenting these conditions were those of 1839 and 1855. The spring of 1839 was dry with low temperature, the cotton plant being scarcely visible the first week of June.

The summer and early fall months were dry, with the lowest stage of water in the Warrior and Alabama rivers ever known, but the yield of cotton per acre in Alabama was the largest ever gathered. The winter and spring of 1855 were dry, the latter cool. But few seed had germinated up to May 25th., but general rains throughout the State in the next three days gave good stands by June 5th. and with occasional summer showers and perfect cultivation, a yield similar to that of 1839 resulted.

The average annual rainfall in Central Alabama, or between the parallels of $31^{\circ} 30'$ and 34° north latitude, is about 55.00 inches, but in 1839 the total was less than 30.00 inches. In 1855 it was 38.00 inches, or 39.27 inches at Greensprings, 37.60 inches at Greensboro and 37.85 inches at Auburn. The summer precipitation each year was simply sufficient to sustain a uniform, healthy growth in the plant, a condition absolutely essential to the retention and maturity of a vigorous fruitage, and but for the fact of the deeply broken soil and its mellow condition, or if within three or four inches of the surface, as is often the case, there had been a hard compact sub-soil, the supply of moisture would have been very deficient, rust and shedding would have followed as in 1883 and 1884 with similar disappointing results.

The large yield of 1870 and 1875, while not presenting the marked features of the two just noticed, were preceded by a dry spring, during which continuous ploughing thoroughly pulverized the soil, causing a deep rooted plant with subsequent healthy growth.

The spring of 1882 was very cool with rainfall for April and May below the average. June 5th. showed a very small but healthy plant well rooted and the soil free from clods and grass. The summer following was one of continuous showers but a deeply broken mellow

soil absorbed and appropriated the apparently superfluous moisture without excessive plant growth or shedding of fruit, and matured the largest crop ever gathered. A candid investigation will convince the most incredulous that preparation and cultivation are the main factors in the production of a cotton crop, and that no full or large crop has been gathered where these conditions were absent.

A few years since Mr. I. Donovan, who lives on poor pine land 11 miles north of Mobile, made a series of experiments which illustrate the subject under discussion most forcibly. The land was prepared by running a furrow with a turning plough as deep as possible, followed by a sharp bull tongue and it in turn by a subsoil which broke the soil to a depth of 18 to 20 inches. Fertilizing the land with one ton of cotton seed meal per acre, he planted first an early variety of corn improved by himself from Ohio seed. During the last week of May while giving his corn the last ploughing cotton was planted by dropping the seed midway between the corn stalks in the same row. The first had nearly matured before the second made any demands on the soil for nutriment, and when growth and fruitage became most active in July and August the entire strength of the soil was given to the maturity of the second crop. The cost of cultivation after the first preparation was less than usually attends the production of a cotton crop in the agricultural counties. The yield was 40 bushels of corn and rather more than 1000 pounds of seed cotton per acre.

A similar experiment was made the next year with the same land prepared and fertilized as before, except that sweet potatoes were substituted for cotton. The result was 60 bushels of corn and 250 bushels of sweet potatoes per acre. The dry hot summer of 1860 witnessed a similar experiment on very poor land near Spring Hill, six miles west of Mobile. One piece of land was spaded to a depth of 20 inches, fertilized with 300 pounds of guano and planted in cotton about June 1st.. An adjoining piece of the same charac-

ter was prepared in the ordinary way by ploughing 3 to 4 inches in depth, fertilized and cultivated in the same manner. That prepared by deep spading remained green throughout the dry hot summer and produced at the rate of 1000 pounds of seed cotton per acre; while the other soon withered, lost its fruit and leaves and produced nothing.

There is no question that healthy plant growth in our climate depends largely on moisture, but results like those of 1839, 1855, 1860, 1870 and 1875 show conclusively that an apparent deficiency of rainfall may, nevertheless, be followed by an abundant crop, provided the soil is in such condition as to utilize the entire summer precipitation; and seasons like 1880 and 1882 furnish corroborative evidence that an apparent excess of moisture may be absorbed without injurious results by a soil, which has been deeply and thoroughly broken.

